ONTARIO AGRICULTURAL COLLEGE.

BULLETIN 127.

FARM POULTRY

WITH THE RESULTS OF SOME EXPERIMENTS IN

FATTENING CHICKENS,

BY

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BULLETIN 127. MAY, 1903.

Ontario Agricultural College and Experimental Farm.

FARM POULTRY, WITH THE RESULTS OF SOME EXPERIMENTS IN FATTENING CHICKENS.

By W. R. Graham, B.S.A., Poultry Manager and Lecturer.

This Bulletin is intended to give information to farmers and others, on general matters pertaining to the keeping of poultry.

It also contains the results of a few experiments which have been conducted at this institution in fattening chickens for the home and export market.

CONSTRUCTION OF POULTRY HOUSES.

We find poultry thriving and yielding good returns in so many different styles of houses, that it is very difficult to lay down any hard and fast rules. The tendency at present is towards cheaper houses, with better ventilation. The hot-house style of housing poultry during the winter has not been satisfactory, many of the houses being damp, and the air in them anything but agreeable. Disease has been quite common; and the results in many cases have been disappointing. To the plans given below, there are no doubt some objections; but there are strong points in each. Many of these houses are giving excellent results in Ontario.

Every poultry house should be light; at least one-third of the south side of it should be of glass, or otherwise opened to the sun. It should face the south-east or south. The sun's rays are very beneficial to fowl, especially during the winter months.

Poultry House of L. H. Baldwin, Deer Park (Toronto).

Mr. L. H. Baldwin's poultry house is a good one. It is well planned and has given good results. I have always found Mr. Baldwin's fowls very healthy and in good laying condition. The point of excellence in this plan of a house is that the fowls are allowed exercise in the open air, and are, at the same time, protected from the wind. It also furnishes a warm roosting pen.

After a very full inspection of several hen-houses erected on many of the leading poultry farms of the Eastern States, Mr. Baldwin decided to build a hen-house on the scratching-shed plan. He came to the conclusion that this plan was best suited for a climate such as they have in Toronto.

His hen-house is a frame building 72 feet long and 10 feet deep, and is divided into four scratching-sheds and four hen-houses proper. The ground plan is shown in Fig. 1. The sills are 4x4 cedars, resting on large stones. The end sill rests on stone, and the sill running the length of the building rests on top of the end sill. The studding used is 2x4 hemlock. The top of the sill is one foot above the surface of the ground, and a base-board is fastened on the inside of the sill, and the floor of the hen-house is filled with sand to the top of the baseboard. The building is banked up on the outside to the same level. The stones upon which the sills rest are placed at varying distances to meet the joists and at intervals of about 8 feet. The north wall is 4 feet high from the top of the sill, and the south wall 7 feet high. In the north wall, the studding is placed at each corner of the hen-house proper and an additional one in each centre, also at the corner of each scratching-shed, and an additional one in the centre. In the south wall the studding is placed in the same way, excepting the one in the centre of the hen-house, which is placed so as to accommodate the window. At the east end, an extra stud stands as a door post; and one at the west end, in the centre. For rafters, he used 2x4 hemlock, placed at 2 feet centres. On the outside of the studding and rafters he used the most ordinary lumber, running the boards lengthwise. The ends of the building, the north wall, and the south fronts of the hen-house proper are covered with a two-ply "ready roofing;" and for the roof he used three-ply "ready roofing." A scantling 2x4 reaches from the north sill to the south sill at the base of each division between scratching pens and hen-houses proper, and between the hen-houses. The division wall between the scratching-shed and the hen-house is made of rough lumber on the scratching-shed side with a lining of tar felt nailed on the interior of these boards, and battened closely with laths to make the joints of the tar felt complete. The division wall between the hen-houses proper is made of 7x8 tongued and grooved flooring, and the other interior walls of the hen-houses proper, that is, the walls against the scratching-sheds and the north and south walls, are lined with 7x8 tongued and grooved dressed material. The ceiling is also completed in the same way. But before the putting on of this dressed material, a second layer of tar felt was placed between the sheeting and rafters, so that there is a dead-air space. The large doors between the scratching-sheds and the hen-houses proper are about three inches thick, made of two thicknesses of 7x8 tongued and grooved dressed material, with a space of one inch between, and lined with tar felt on the inside of each thickness. These doors are raised a foot above the level of the sills, and in this space near the south wall is cut small doors for the poultry, 10 inches wide, having sliding doors.

Interior Arrangements.

The dropping board is three feet wide and 18 inches above the level of the top of the sills. Two roosts, each 2x3, are placed on the

Fig. 1.

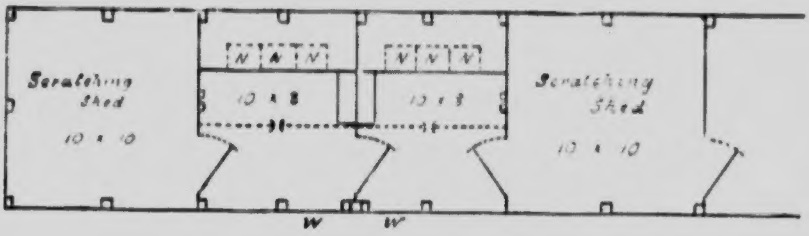
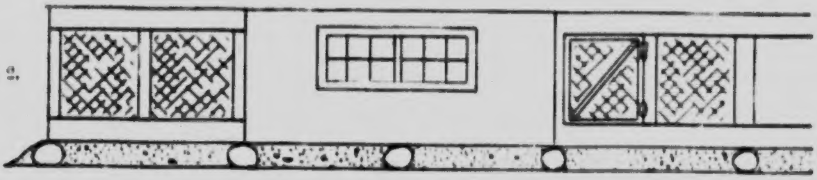


Fig. 2.



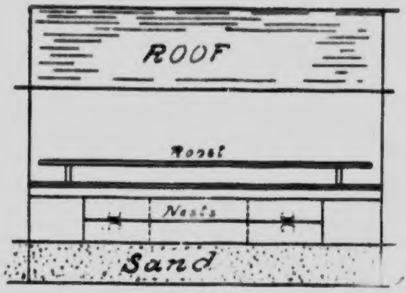


Fig. 3.

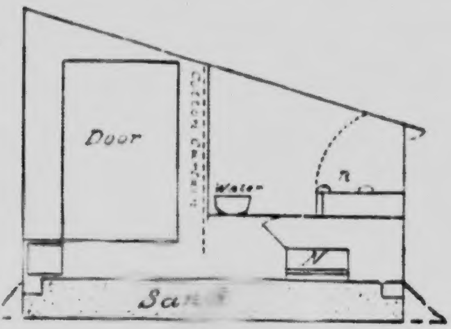


Fig. 4

POULTRY HOUSE OF L. H. BALDWIN, DEER PARK.

Fig. 1. Ground plan of one half of the house. Fig. 2. Front elevation. Fig. 3. Cross section of a single pen from east to west. Fig. 4. Cross section of a single pen from north to south.

flat side, fastened together by a cross strip which is hinged to the north wall. Two legs support the roosts on the other side. The roosts being hinged, they can be lifted up and fastened to the roof so as to leave a clear space when making the daily cleaning. The roosts come short of each pen by about two inches. Three nests are allowed to each pen. These are each 18 inches square, having the ends solid. The nests are placed under the dropping board facing the north wall, rest on the sand, and can be taken out for cleaning. The back of the nest is made in two pieces. The upper part is fastened to the lower board by spring hinges, which enables one in collecting eggs to reach the nest conveniently ; and the spring hinges make the top board fly back into place. Against the inside division between the hen-houses proper, a 12 inch board extends on the level of the dropping board to within 12 inches of the door, and an upright 12 inch board is fastened to the end of this and runs up to the ceiling. To correspond with it, a board is placed against the opposite wall, and a cotton curtain on a two inch roller is fastened to the ceilling. This curtain is shown by the dotted lines across pens in Fig. 4 and at x in Fig. 1 When this curtain is down it comes to the bottom of the two last mentioned upright boards that is to about 2 inches below the level of the dropping board. The purpose of this curtain is to protect the fowls on very cold nights. Mr. Baldwin has found that it is not necessary to use it when the pens contain over 15 birds ; but if the number is reduced, and the thermometer drops to the neighborhood of zero, it is well to let it down.

Plenty of Light.

The windows in front of the hen-houses proper are each three feet wide and two feet 6 inches high, containing 6 panes, 10x12 inches each. The windows are placed high in the front wall and slide to the right and left. The windows being placed high up, the sun in winter, when it is low in the heavens, shines on to the roost and dropping board. The door between the hen-houses proper, which is also a foot above the level of the sills, is a simple door of 7x8 inch stuff, the upper half being made of wire netting. The front of each scratching shed is divided in two by the centre studding, on each side of which there are cotton screens hinged at the top, and reaching down to within one foot of the top of the sill ; and, when down, close upon top of a rainboard which slopes to the outside, so that rain beating against the cotton screen is carried outside ; and this keeps the interior dry. These screens swing up to the roof, and are there caught by hooks from the rafters. The front of each scratching-shed is closed with two-inch mesh wire netting. (One-inch mesh should have been used to keep out the sparrows, which now get in and run off with a lot of grain). An eaves-trough runs the length of the building, distributing the water east and west. Drinking fountains are placed on the end of the board that runs out from the dropping board ; and on the wall opposite thereto the boxes for grit and oyster shells are hung.

Sanitary Precautions.

The interior of the hen-houses and the scratching-sheds is filled with sand to the level of the top of the sill ; and on top of this a plentiful supply of loose straw is kept, to encourage the birds to scratch and thereby get exercise. In August the straw is all cleaned out; and the sand, so far as it appears to be soiled, say, to a depth of four or five inches, is all taken out, and fresh sand put in its place. It is advisable to do this in August, so that the sand may become perfectly dry before the winter sets in. No straw is placed on top of the sand until the time comes to close the birds up for the winter. The windows of the hen-house proper are open every day. Of course, when the weather is stormy or bitterly cold they are open only for 15 minutes or half an hour in the middle of the day. When the sun is shining brightly they may be left open for some hours. This thoroughly ventilates the hen-houses, dries up all moisture, and keeps the place clean and sweet. The screen in front of the scratching-shed is let down only on very cold days, and when the weather is cold and stormy, the idea being to keep the open shed dry where the birds take exercise in the open air.

This method of housing poultry keeps the stock in the most vigorous health; and this is the secret of Mr. Baldwin's success in obtaining a plentiful supply of fertile eggs. He began incubating in January last, and out of 1,100 White Wyandotte eggs set during the season he obtained 66 per cent. of chicks. The runs of his hen-houses extend to the north and west of his buildings, as it best suits the shape of his lot. The runs are in most cases placed to the south of the building; and sometimes, where it is possible, they are extended north and south, and are used alternately. From the practical experience of five years' use of the building, Mr. Baldwin's opinion is that it is well adapted in this section of the country for keeping breeding stock and maintaining it in most vigorous health, which is the foundation of success. He keeps only White Wyandottes, and thinks that the building would, perhaps, be too cold for the more delicate breeds, although he at one time kept White Leghorns in it with considerable success. In one phenomenal hatch of Leghorn eggs he secured 95 chicks from 95 fertile eggs, out of a total setting of 100 eggs. This affords some idea of the vigor of the stock, and the fertility of the eggs secured from birds kept in hen-houses erected on this plan. Mr. Baldwin believes that many who have adopted the scratching-shed hen house have adjusted windows to the front of the scratching-shed in place of the screen; and this might be an advantage, especially in sections of the country where the weather is more severe than in Toronto.

Cost of the Building.

He estimates the cost of his building at $250, allowing for his own time; but on account of the increased cost of lumber and labor, a similar building would now cost about $300. The cost, of course, depends upon the facilities for obtaining material and labor. He keeps about 18 hens in each pen during the winter, and obtains a plentiful supply of eggs.

THE POULTRY HOUSES AT O. A. C.

The Colony House in use at this College is more or less of an experiment, but it is cheaply constructed, and allows a warm roosting pen and exercise in the open air. The canvas door protects the fowls from the extremely cold winds. In very severe weather the board door in front of the house may be shut.

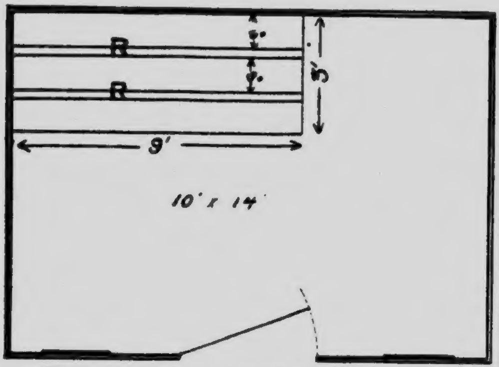


Fig. 5.—Ground plan of colony house at O.A.C.

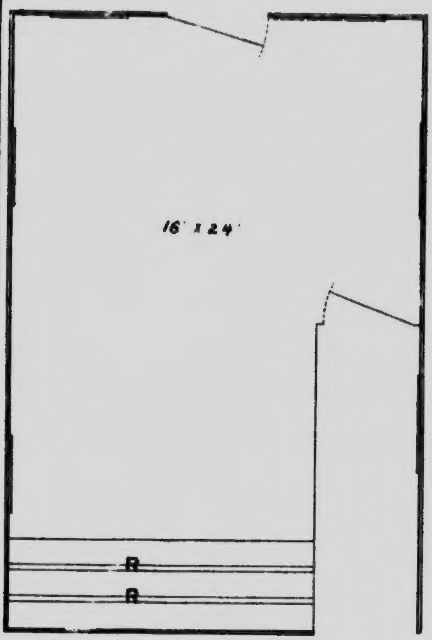


Fig. 7.—Ground plan of closed pen.
R R roosts.

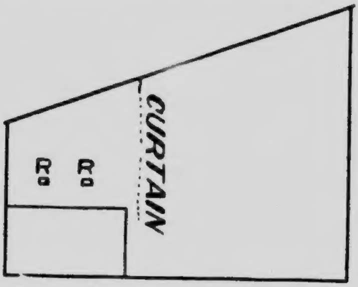


Fig. 6.—Cross section of colony house.
R, R, roosts.

This house is made of a single thickness of planed lumber, the cracks between boards being covered by battens. It is not sheeted on the inside, except in the roosting compartment, which is lined with paper and matched lumber. We wintered Plymouth and Wyandotte fowls successfully in this coop before the roosting compartment was put in. It was, however, so cold at night time, in very severe weather, that egg production was practically stopped for a day or two. I would not recommend its use where Leghorns or such birds are to be kept. This house will accommodate from 20 to 25 chickens.

The plan of the closed house in use at this College (see Figs. 7 and 8) is designed to admit of exercising the fowls in the open air, to have a constant supply of fresh air, and a warm roosting pen. Formerly, this house was equipped with double doors, walls, and windows; it was as tight as a drum, and there was a constant dampness during the winter, owing largely to a lack of fresh air.

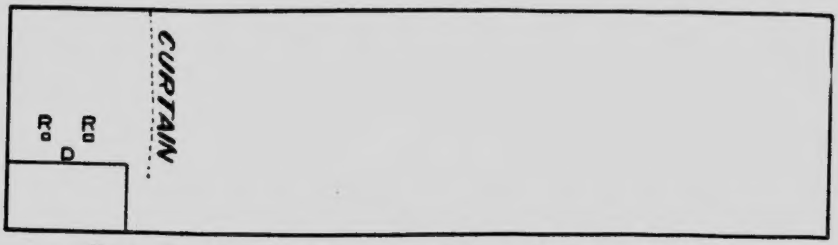


Fig. 8.—Crossed section of closed pen. R, R, roosts; D, dropping board.

The substitution of a curtain for the door on the south side will, we are satisfied, admit abundance of air and do away with the dampness. This house will accommodate from 40 to 50 fowls.

GENERAL RULES FOR BUILDING.

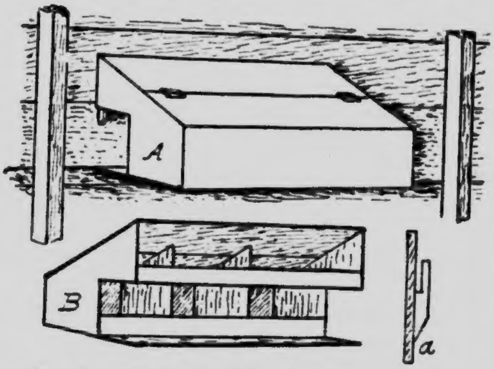
Every hen should be allowed at least 6 square feet of space in the scratching pen, and about 4 square feet in the roosting pen. Each bird of the Plymouth Rock, Wyandotte, and such breeds, requires about 9 inches of perch room; Leghorns, etc., about 8 inches; and Brahmas, 10 inches.

Roosts should be made low, or near the ground. There are several reasons for this. Fowls of the heavier breeds cannot fly high, and those of the lighter breeds frequently injure the soles of their feet in jumping from high perches.

When dropping boards are used, they should be moderately low down, to admit of easy cleaning. Dropping boards should be made of matched lumber, and should be 20 inches wide for one roost, and three feet for two perches, the first being placed eight to ten inches from the wall.

Most poultry men prefer roosts 2 inches by 2 inches, with edges slightly rounded.

Nests. Many use only old boxes; but such nests, if near the ground, are apt to induce egg-eating. Dark nests prevent this. (Figs. 9 and 10.)



Figs. 9 and 10. Front and back views of nests. (*Poultry Craft.*)

Nests are usually made from 12 to 15 inches square.

Ground floors are more in favor than board floors, and cost much less.

In my own experience, the best results are obtained from keeping 20 to 25 birds in a flock. Some succeed with 60 to 75 in a flock; but these are the minority.

BREEDS OF POULTRY.

Plymouth Rocks. There are three varieties of this breed, viz., Barred Plymouth Rocks, White Plymouth Rocks and Buff Plymouth Rocks. The Barred variety is the oldest and most popular, owing to its having been introduced some years previous to the last two named varieties.

The same general characteristics apply to the three varieties. They are fairly hardy, good winter layers, fair summer layers, lay brown eggs, make fair mothers, are sitters, have naturally yellow legs and flesh, have single combs, and are all-round good general purpose fowl.

The standard weights are: Cock, 9½ lbs.; cockerel, 8 lbs.; hen, 7½ lbs., and pullet, 6½ lbs.

Wyandottes. There are several varieties of this breed, viz., White, Black, Buff, Silver-Laced, Golden-Laced, Partridge, and Silver-Pencilled.

The last two varieties are comparatively new, and are not at present nearly so plentiful as are the other varieties.

The White Wyandotte is bred by many market poultrymen, and is very popular.

This breed, in its different varieties, possesses the same general characteristics as the Rocks, with the exception that they have a rose-comb and are more blocky in appearance.

The standard weights are: Cock, 8½ lbs.; cockerel, 7½ lbs.; hen, 6½ lbs., and pullet, 5½ lbs.

Rhode Island Reds. This breed is bred extensively by the farmers in the State of Rhode Island, where it originated. It has not as yet been admitted to the American standard of perfection. Hence we have no official description of the breed, except that given by the Rhode-Island-Red Club.

They are said to be fairly hardy, fair winter and summer layers, are setters, only fair mothers, brown egg breed, have yellow legs and skin and mature early. They are a reddish buff in color, with a strong tendency to black colored tails and wings; also black ticking in the hackle feathers.

The R.I.R. Club gives the following weights: Cock, 7 lbs.; cockerel, 6 lbs.; hen, 5½ lbs., and pullet, 4½ lbs.

Orpingtons. There are three varieties of this breed, viz., Black, White, and Buff Orpingtons. The Buff variety is far more popular than the other two. Buff Orpingtons seem to be well adapted to this country, and have the color of flesh sought after in the British market. They will certainly be great rivals of the Rocks and Wyandottes as the farmers' fowl.

They are fairly hardy, good winter layers, brown egg breed, are setters, good mothers, have white legs, white skin, and usually have single combs. There are a few rose-comb Buffs, but they are rather scarce.

Standard weights: Cock, 10½ lbs; hen, 8½ lbs.; cockerel, 9 lbs., and pullet, 7 lbs.

In breeding this variety, where market chickens are wanted, I would prefer birds of at least one pound less in weight than the standard weight given.

Leghorns. There are several varieties of Leghorns. The most popular are the Single-Comb White, Brown, Buff, and Black. The Rose-Comb White and Brown are also bred to some extent.

All Leghorns are considered to be non-sitters. An occasional one shows some inclination to sit, but these are not to be relied upon. They are excellent layers, especially during the summer months. The eggs are white in color. As a rule, the Single-Comb White lays a larger egg than the other varieties.

Leghorns require a fairly warm house on account of the size of their comb, particularly the male bird. These birds are fairly hardy and vigorous. They are too small for table use, unless as broilers.

Minorcas. The Single-Comb Black is the most popular variety. The Rose-Comb Black and Single-Comb White are not so generally bred. This breed is larger than the Leghorn or Andalusian. They lay very large white eggs. They are a good summer layers and are usually non-sitters. Their very large combs are an objection in cold climates. These fowls are fairly hardy and vigorous.

Standard weight: Cock, 8 lbs.; hen, 6½ lbs.; cockerel, 6½ lbs.; pullet, 5½ lbs.

Blue Andalusians. This breed is midway in size between the Minorca and Leghorn, and generally non-sitters, and lay a large white egg. They are splendid summer layers. The chief objection to them is that they do not breed true to color, the chicks coming blue, black, and nearly white. There are usually about 50 per cent. blue chicks. The size of their combs is also considered an objection in a cold climate. They are fairly hardy and vigorous.

Standard weight: Cock, 6½ lbs.; hen, 5½ lbs.: cockerel, 5½ lbs.; pullet, 4½ lbs.

Games. The Indian Game is the chief variety of interest to the farmer. They are a good market fowl, having a splendid development of breast meat; but their breast is considered by some to be rather short. They are fairly hardy, but are only moderate layers of medium-sized brown eggs. They are good sitters and mothers. Crossed with Dorkings, Rocks, or Wyandottes, they make excellent fowls for the market. These crosses are, however, seldom good layers.

Standard weight: Cock, 9 lbs ; hen, 6½ lbs.; cockerel, 7½ lbs.; pullet, 5½ lbs.

Dorkings. There are several varieties of this breed, the most popular being the Silver Grey and colored varieties. Birds of this breed are among the best market fowls yet produced, and they are fair layers of good-sized, white eggs. They are fair sitters and mothers. They have white legs, white skin, and five toes.

The fault of this breed in Ontario is that they do not do well in confinement, and are not considered hardy. With some farmers, however, they are very popular.

Standard weight of Silver Grey variety: Cock, 8 lbs.; hen, 6½ lbs.; cockerel, 7 lbs.; pullet, 5½ lbs.

EGG PRODUCTION.

To produce eggs in winter time, we have to consider the stock, the quarters or housing, the feed, and the weather.

Stock. The stock needs to be the best obtainable. An ideal bird for winter egg production is a pullet that is mature at about Nov. 1st, and is strong and vigorous, and of a good laying strain. Something depends upon the breed, but more on the strain of the breed; also much upon a good strong constitution, and an abundance of vigor. These are the essential points.

To get pullets of such birds as Rocks, Wyandottes and Orpingtons matured by November, it is necessary to hatch them in April. Some seasons May chicks mature quickly and begin laying about the first of December, but not as a rule. If a pullet does not commence to lay before Christmas, it is doubtful if she will begin much before March, unless the weather is favorable. Then again, good yearling hens that have moulted early are likely layers. The problem, how to get hens to moult early, is not entirely solved as yet. No doubt it has been noticed that hens which sit and bring out a brood of chicks from June 10th to July, usually moult about the time they are leaving their chicks. Some hens that sit earlier also moult early; but as a rule they begin to lay after sitting, and are rather inclined to late moulting,

From the above, it would appear that the best method to get the flock in general to moult would be to place the flock under conditions similar to those of the sitting hen. This is done by some egg-farmers with more or less success. The plan followed is to change the hens to a new, free range about July 1st, and feed but very lightly, not more than one handful of grain to each hen daily. The object is to induce the hens to dine largely on grass and water, and *stop egg production.* After being thus treated for from two to three weeks, the hens are again well fed on a good laying ration. In many cases they begin to moult; and, if fed well, get their new coat of feathers in quickly, and thereby save time. I have had a few hens which have begun to lay heavily as soon as I have started to feed them well; but this is not very often the case.

Hens over two years of age are seldom good layers. Leghorns Minorcas, etc., are sometimes good during their third and fourth years; but, generally speaking, the Rocks and such fowls are of little or no use as layers after the second year, being much inclined to become excessively fat.

For *summer egg production* the lighter breeds and late-hatched pullets of the heavier breeds are best. Do not expect a hen that has laid well all winter to lay exceptionally well during the summer. A hen that lays early is inclined to show a desire to sit early in the season. The following tables show plainly that eggs can be produced at a profit during the summer, even where all the grain has to be bought.

EGG-PRODUCTION AT THE O. A. C. IN 1901.

April 22 to May 22nd. Rocks—13 hens, 1 cock:

Mixed feed—17 687 lbs., at $1.33 per cwt.	23 526	cents.
Bone—16.687 lbs., at $1 00 per cwt	16 687	"
Mash—32.375 lbs., at 90c. per cwt	29 137	"
Wheat—21.875 lbs., at $1.13 per cwt	24.71	"
Milk—32 lbs., at 10c. per cwt	3.20	"
Total	97.26	"

Eggs laid, 16 dozen; cost per dozen, 6.08 cents.
Nearly all Rocks were broody during last week.

April 22nd to May 22nd. Andalusians—13 hens, 1 cock:

Mixed cracked grain—14.3 lbs., at $1.33 per cwt	19.01	cents.
Green bone—13 75 lbs., at $1.00 per cwt	13.75	"
Mash—35 lbs., at 90c. per cwt	31.50	"
Wheat—24 lbs., at $1.33 per cwt., or 68c. per bushel	31.92	"
Milk—35 lbs., at 10c. per cwt	3.5	"
Total	99.68	"

Eggs laid, 20½ dozen; c[illegible]r dozen, 4.86 cents.

May 22nd to June 22nd—Barred Rocks:

Oats—2 lbs. 8 ozs., at $1.00 per cwt	2.5	cents.
Bone—2 lbs., at $1.00 per cwt	2.	"
Mash—40 lbs., at 90c. per cwt	36.	"
Milk—40 lbs., at 10c. per cwt	4.	"
Wheat—34.8 lbs., at $1.18 per cwt	39.32	"
Total	83.82	"

Eggs laid, 13 dozen and 10 eggs, cost per dozen, 6.15 cents.

May 22nd to June 22nd. **Andalusians:**

Milk—40 lbs., at 10c. per cwt	4.	cents.
Oats—3 lbs., at $1.00 per cwt	3.	"
Wheat—35.437 lbs. at $1.13 per cwt	40.04	"
Mash—40 lbs., at 90c. per cwt.	36.	"
Bone—11.375 lbs., at $1.00 per cwt	11.37	"
Total	94.41	"

Eggs laid, 18 dozen and 2; cost per dozen, 5.06 cents.

June 22nd to July 22nd. **Barred Rocks:**

Wheat—26.375 lbs., at $1.13 per cwt	29.80	cents.
Oats—6.25 lbs., at $1.00 per cwt.	6.25	"
Mash—41.75 lbs., at 90c. per cwt.	37.57	"
Milk—41 lbs., at 10c. per cwt	4.1	"
Bone—1 lb., at $1.00 per cwt.	1.00	"
Total	78.72	"

Eggs laid, 13 dozen and 10; cost per dozen, 5.69 cents.

June 22nd to July 22nd. **Andalusians:**

Wheat—35.625 lbs., at $1.13 per cwt.	40.25	cents.
Oats—6.25 lbs., at $1.00 per cwt	6.25	"
Mash—40 lbs., at 90c. per cwt	36.00	"
Milk—40 lbs., at 10c per cwt.	4.00	"
Bone—1 lb., at $1.00 per cwt.	1.00	"
Total cost	87.50	"

Eggs laid, 16 dozen and 1; cost per dozen, 5.44 cents.

July 22nd to August 22nd. **Barred Rocks:**

Wheat—32.625 lbs., at $1.13 per cwt	36.86	cents.
Oats—9 lbs., at $1.00 per cwt.	9.00	"
Mash—35.9 lbs., at 90c. per cwt.	32.31	"
Milk—40 lbs., at 10c. per cwt	4.00	"
Bone—2 lbs., at $1.00 per cwt.	2.00	"
Total cost	84.17	"

Eggs laid, 14 dozen and 1; cost per dozen, 6.2 cents.

July 22nd to August 22nd. **Andalusians:**

Wheat—27.25 lbs., at $1.13 per cwt.	30.79	cents.
Oats—14.875 lbs., at $1.00 per cwt.	14.875	"
Mash—40.5 lbs., at 90c. per cwt	36.45	"
Milk—40 lbs., at 10c. per cwt.	4.00	"
Bone—3 lbs., at $1.00 per cwt	3.00	"
Total cost	89.115	"

Eggs laid, 14 dozen and 9; cost per dozen, 6 cents.
Average cost per dozen for Rocks, 6.02 cents per dozen.
Average cost per dozen for Andalusians, 5.34 cents per dozen.

HOUSING. The housing of fowl was discussed in a previous paragraph. It is well to remember, however, that the house should be clean, the droppings being removed at least twice a week; it should also be well aired and kept dry, to avoid dampness and foul, stagnant air.

FEEDS AND FEEDING. The main points to be considered in feeding are, that there be a good supply of green food, meat food, and grain, the latter both ground and whole. It is also necessary to feed so as to induce birds to take exercise. In winter green food is supplied by feeding cabbage, turnips, or other roots, pulped or whole, and by feeding steamed cut clover or clover leaves in the mash. Meat food is supplied in the form of ground green bone, cooked offal, such a beef heads, etc., and in the form of animal meal. In Ontario the ground bone is perhaps the best and cheapest, where one has a bone mill; where not, beef heads, livers, etc., give good results. Animal meal, dried blood, etc., are good foods, but in many cases are more expensive than the others mentioned. However, they are very useful during the hot weather, when it is almost impossible to use fresh meat. Partially decayed meat *should not be used*, as it is not healthful.

Wheat is undoubtedly the most popular grain food for fowl in Ontario. It is certainly a good food, and is very much relished by poultry.

Corn is not used so much in Ontario as in New England States. There it appears to be used quite freely in both summer and winter feeding of fowls. It is used whole, ground, and cracked, the meal being used principally in the mash foods. Cracked corn is used largely for young chicks and fowls when scattered in the litter. The whole corn is rather large and conspicuous; and, when in the litter, does not give enough exercise. I am of the opinion that corn can be used in portions of Ontario, where it is grown extensively, much more freely than it has been heretofore. Corn is a heating and fattening food, and is therefore best adapted for winter use. It is considered by many, when fed in large quantity, to make the hens fat: yet it is used extensively by many progressive poultrymen with little or no evil effects.

Oats should be a first-class food for poultry; but, owing to the large percentage of hull, they are not relished by chickens, and for this reason they are somewhat indigestible. When ground they are used pretty freely in mash food: also the rolled and granulated oatmeals are used for feeding young chicks. The ground oat, without the hull, is used extensively for fattening fowl.

Barley, either whole or ground, is very good. It has rather too much hull; but otherwise it is a satisfactory food. It is considered by many to be next to wheat in point of value.

Buckwheat is very popular as an egg-producer, in districts where it is grown extensively. Some difficulty is at times experienced when first feeding it to fowls in getting them to eat it, but this is usually overcome in a day or so, if other feeds are withheld. Boiling the buckwheat will sometimes start the birds to eat it. After the birds once get accustomed to its appearance, it is much relished by them. Ground buckwheat is an excellent food to use in a fattening ration. It is somewhat like corn in its fattening properties and therefore it is better for winter than summer use.

Shorts and wheat bran are both used extensively in making mashes, or soft foods. They are excellent foods to use in maintaining the health of the flock.

The general method of feeding is to give a mash of mixed ground grains, moistened with water or milk, in the morning; a little whole grain scattered in the straw covering the floor, at noon; and all the whole grain they will eat at night. This latter meal is usually fed in the straw. Some poultrymen adopt the plan of not feeding the mash until evening. We have been practising this plan for some time, and we like it very well. The objection to the former plan is that the hen is likely to become gorged with food early in the morning, and thus take to the roost for the rest of the day, which is usually followed by hens becoming too fat, and the egg record becoming small; but notwithstanding, many successful poultrymen use this method to advantage. The objection to feeding the mash at night is that it becomes quickly digested, and the bird has not sufficient food to last it during the long winter night; but this objection can be overcome by giving a little whole grain after the mash at night.

Some poultrymen feed their fowls but twice a day, morning and evening, and get very good results; but I favor feeding three times a day. Our plan is somewhat as follows:

Early in the morning the fowls are given half a handful each of whole grain. This is buried in the litter on the floor. Thus the fowls get exercise (a very necessary thing) in searching for it and at the same time keep themselves warm. At noon about two handfuls of grain are given to a dozen hens in the litter; they are also given all the roots they will eat, either pulped or whole, as fowl relish mangels, sugar beets and turnips. Cabbage also—a very good green food—is sometimes given. About four o'clock in the afternoon they are fed a mash composed of equal parts of bran, shorts, oat-chop and corn-meal (during cold weather); and to this is added about 10 per cent. of animal meal, if we have not cut, green bone or cooked meat. These foods are thoroughly mixed together in the dry state, after which is added steeped clover, which has been prepared by getting a bucket of clover leaves, or cut clover hay, and scalding it with boiling water. This is done early in the morning, and the bucket is kept covered with a thick sack throughout the day. This will be quite warm at night, if it has been kept in a warm place. There is usually sufficient liquid to moisten the meal that has been mixed. Our aim is to have about one-third of the ration, in bulk, of clover. After the mash a small amount of whole grain is fed in the straw. There is—and should be —a plentiful supply of good, *pure water within easy reach at all times.*

NATURAL AND ARTIFICIAL INCUBATION.

Whether it will pay to buy incubators and brooders depends largely on one's circumstances. Where chicks are wanted in considerable numbers earlier than April 15th, an incubator becomes practically a necessity, as it is seldom that hens become broody in numbers until after the 1st of April. Again, where one wishes to hatch more than 150 chicks, an incubator is in many cases cheaper and better than the natural method. It is also a necessity where one is breeding from the non-setting varieties.

There are numerous illustrations of chicks being raised in large numbers by the natural method in the States of Rhode Island and Massachusetts, particularly in the former State. Where this method is followed, the chicks are hatched largely during the months of May and June; and where from 500 to 1,500 laying hens are kept, there is little difficulty in getting a sufficient number of broody hens. Those who are keeping large numbers of hens appear to be well satisfied with the natural method; but there can be no doubt that the number of incubators in use is increasing from year to year.

Hen and Incubator. As to results, I am of the opinion that *on the average*, the incubator will hatch as many chicks as the hen. There is no doubt that some individual hens hatch a much higher percentage than a machine; but when we put 240 eggs into a machine and the same number under 20 hens, our experience is that we get about equal results in the number of chicks hatched.

The average hatch is probably one chicken from every two eggs set. This, of course, varies with the different seasons, also with the percentage of fertile eggs, and the strength of the germ. We have found during the months of February and March, when the ground is covered with snow and the fowls are closely housed, that the percentage of fertile eggs is small, and that the germs are very weak. Under such conditions we have very poor hatches and chicks that are very hard to rear. Much better eggs are obtained in December and early January, or when the fowls get out into the fresh air and are able to pick some grass. Thus it will be seen that, as a general rule, as the percentage of fertile eggs increases, the vitality of the germ increases, the percentage hatched is larger and the mortality among the young chicks smaller. For example, we would expect to get a much larger percentage hatch of the fertile eggs from eggs that were 90 per cent. fertile than from those that were 60 per cent fertile; and, moreover, we would figure on raising a much larger percentage of chicks from the former eggs than from the latter, owing to the chicks being stronger and having greater vitality.

Setting the Hen. It is generally agreed that, in order to secure a good hatch, the hen must be placed where other hens are not likely to disturb her; for, as a rule, we seldom get good hatches where other hens lay in the nest with the sitter. Some farmers do not set a hen until one becomes broody on a nest where no others lay, which often necessitates late chicks. The difficulty can be overcome by making a new nest for the broody hen. Get a box about 12 inches square and 6 inches deep; put some earth, or an overturned sod, in the bottom, taking care to have the corners very full so that no eggs can roll out from the hen and get chilled; next put on about two inches of straw or chaff; and then put a few earthen eggs into the nest. Place the nest in some pen where nothing can disturb the hen, and put her on after dark. Feed and water must be within easy reach and a dust-bath should also be convenient. If the hen is sitting quiet the next day, you will be safe in putting the eggs under her. In our experience we get 90 per cent. of the hens to sit by following this method.

It should be remembered that the hen will be in better condition if dusted with insect powder when set, and also a few days before the hatch comes off. This will usually keep the lice in check, especially if some tansy or mint leaves are used in making the nest.

When hens are to be set in large numbers, I know of no better method than that adopted by the Rhode Island farmers. Early in the spring, the hens are set in any old outbuilding; later on they are set as seen in the cut, that is, the nests are stacked tier upon tier; a few boards serve as a shelter; and the wire run gives room for some green food, a dust bath, etc. The hens are generally let off to feed and water every other day. It is considered advisable to have an attendant present to see that the hens get back to the proper nests; also to prevent their fighting.

Incubators. There is really very little known about the running of incubators. Some people succeed in hatching a large percentage, while others, under exactly the same circumstances, fail. The exact reason why, we do not know. This much, however, can be said, the machine should not be placed in a direct draught, nor yet in a building where there is a lack of ventilation. Fresh air is one of the most important things in an incubator room. I have known machines to hatch well in well-ventilated cellars, kitchens, dining-rooms and bed-rooms. Hardly any two people agree as to which is the best place to operate the machine. As a general rule, it is wise to follow the manufacturer's directions. I find that different makes of incubators require different treatment, both as to temperature and otherwise, and we generally get the best results when running closely to the directions. Where possible, the temperature in the room should vary but little: for, if it varies 30 to 40 degrees in 24 hours, it is very hard to keep an even temperature in the machine; and it is absurd to expect that the machine will not vary with such changes in the surrounding temperature.

REARING OF CHICKS.

Chickens hatched in an incubator can be reared either with hens or with a brooder. Some people are able to make good hatches with their incubators; but they are unable to rear the chickens in brooders. In this case I would advise the use of broody hens for mothers; and the same would apply to those who have an incubator, but do not care to invest in a brooder.

The best plan I know of to get the broody hens to take the chicks, is to give the hen two or three eggs out of the incubator on the 18th or 19th day and allow her to hatch them. When your incubator hatch is over take a dozen or fifteen chickens and put them under the hen after dark. Even if they happen to differ in color from those she has hatched, she will mother them all the same. If [illegible] give them to her in the day time she may not do so. Never [illegible] to give the hen a thorough dusting before giving her any egg[illegible] there is one thing more than another that requires careful atte[illegible] in rearing young chickens, it is to keep them free from lice. If [illegible] get upon them, from the hen or elsewhere, a large proportion of [illegible] will be almost sure to die.

There are many good brooders upon the market which are [illegible] described in the manufacturers' catalogues; hence a description here is unnecessary. Personally, I am in favor of a three-compartment brooder, as it admits of keeping the chicks in near the heat when young, and on stormy days. The brooder lamp should always be arranged so as to give little chance of fire.

If the brooder can be placed in a small portable house, it is a good plan, as the brooder is thus protected from stormy cold winds in the early spring; also from the heat later on. The house protects the chicks from rain, and serves as a roosting coop after they become too large to stay in the brooder.

Chicks should not be fed until they are at least 36 hours old. It is a serious mistake to feed them earlier. Too early feeding is the cause of indigestion and bowel trouble in many cases. We try to keep the temperature of the brooder between 90 and 95 degrees throughout the first week. After the first week the temperature is gradually lowered, generally speaking, about 1 degree a day. When the chicks are put into the brooder, it is well to remember that every 15 chicks will raise the temperature of the brooder 1 degree. Be careful not to get your brooder too hot, nor yet so cool as to chill the chicks. This is very important, especially during the first 10 days.

The floor should be covered with dry sand or clover chaff before the chicks are put into the brooder. Luke warm water should also be put into the brooder for drink just before the chickens are taken from the machine. I have had best success in starting young chicks on hard-boiled eggs, finely chopped, shell included and bread crumbs—about 4 parts by weight of bread to one of egg This is fed dry. After the first two days we begin to give an occasional feed of seed chick-food, which is made as follows:

Cracked wheat	25	parts.
Granulated oat meal	15	"
Millett seed	12	"
Small cracked corn	10	"
Small cracked peas	6	"
Broken rice	2	"
Rape seed	1	"
Grit (chicken size)	10	"

This can be used for the first feed and continued through the first 8 to 10 weeks with good results. We aim to feed the chicks five times a day. Generally after the first few days, there are three feeds a day of this chick-food, one of bread and milk (the bread being squeezed dry and crumbled), and one of whole wheat, or a mash made of equal parts of bran, shorts and corn meal, to which has been added 10 per cent. of animal meal or blood meal. If we can secure fresh liver and get it boiled, this is generally given twice a week, and the animal meal is than omitted from the mash. If the chicks cannot get out to run about, the seed chick-food may be scattered in the chaff, and the little chicks will work away most of the day for it. This gives them exercise, which is a necessity in rearing chicks. If there is no green food to reach, it must be supplied. Lettuce is excellent. Sprouted grains are very good, as is also root sprout, cabbage, rape, etc.

When the chicks get to be about 8 weeks of age, we usually feed about three times a day—the mash food in the morning and whole wheat and cracked corn at noon and night. If we are anxious to force the chicks, we give two feeds of mash and increase the animal meal a little.

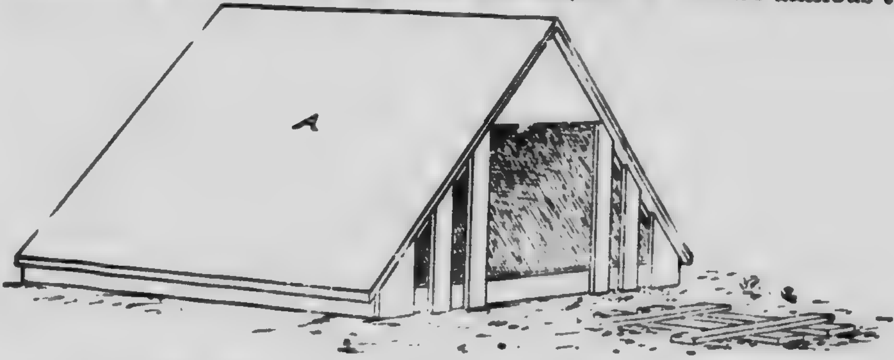


Fig. 11. Coop A.—Each side of roof, 24 in. by 30 in.; bottom, 2 ft. 4 in.

The chicks are taken from the brooders at from 6 to 8 weeks of age, according to the weather. A small coop (Fig. 11.) is set in front of the brooder, so that the chickens cannot get to the brooder entrance, the result being that they get into the coop A. After a day or two take away your brooder, and the coop can then be moved daily to fresh ground. This will keep the coop clean. When the chicks get too large for the coop A, which will be in about ten weeks, they are put into coop B. (Fig. 12.) The same process is gone through with coop B. It is set in front of coop A, so as to obstruct the entrance; and the chicks then go into the coop B, and soon take to the roost. Coop B will roost 20 chicks until full grown. Try to keep your chickens roosting in the open air as long as possible. Never house them in close, stuffy houses. If you do they will be sure to go wrong, become weak, and be of little or no value, either as breeders or egg-producers.

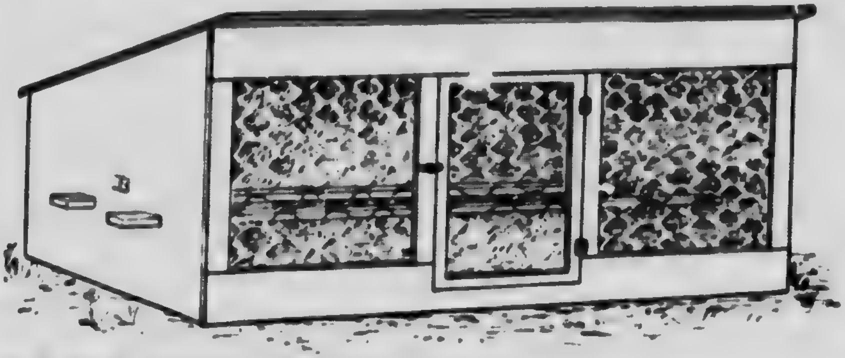


Fig. 12. Coop B,—Length, 6 ft. ; width, 2 ft. 6 in. ; height in front, 2 ft. 4 in. ; height at back, 18 in.

BREEDING MARKET FOWLS.

When looking over dressed poultry in some of the exporter's shops, I have often thought how easy it would be to improve the appearance of much of the ordinary poultry, and some of that which is specially fattened, if the birds were bred to a proper type. I have spent much time in examining different types of birds, alive and dressed, and in observing the feeding capacity of certain types; but it would take years to arrive at definite conclusions on these points. I am however of the opinion that one of the most important things to be sought after is *constitution*. This may have no actual market value, but it certainly has much to do with the bird's ability to grow and put on flesh. What we want is a good feeder, and an economical producer. Generally, a bird with a short, stout, well-curved beak, a broad head (not too long), and a bright, clear eye, has a good constitution. And I have noticed that when a bird has a long, narrow beak, a thin, long comb and head, and an eye somewhat sunken in the head, it is usually lacking in constitution. Such a bird is likely to have a narrow, long body and long legs, upon which it seldom stands straight. There are some exceptions to this rule; yet, generally speaking, if a bird has a good head, the chances are favorable for a good body; and, if it has a poor head the chances are against it. I have frequently noticed in the Rose-comb breeds, such as Wyandottes, that a good-shaped one is seldom found with a long, narrow comb.

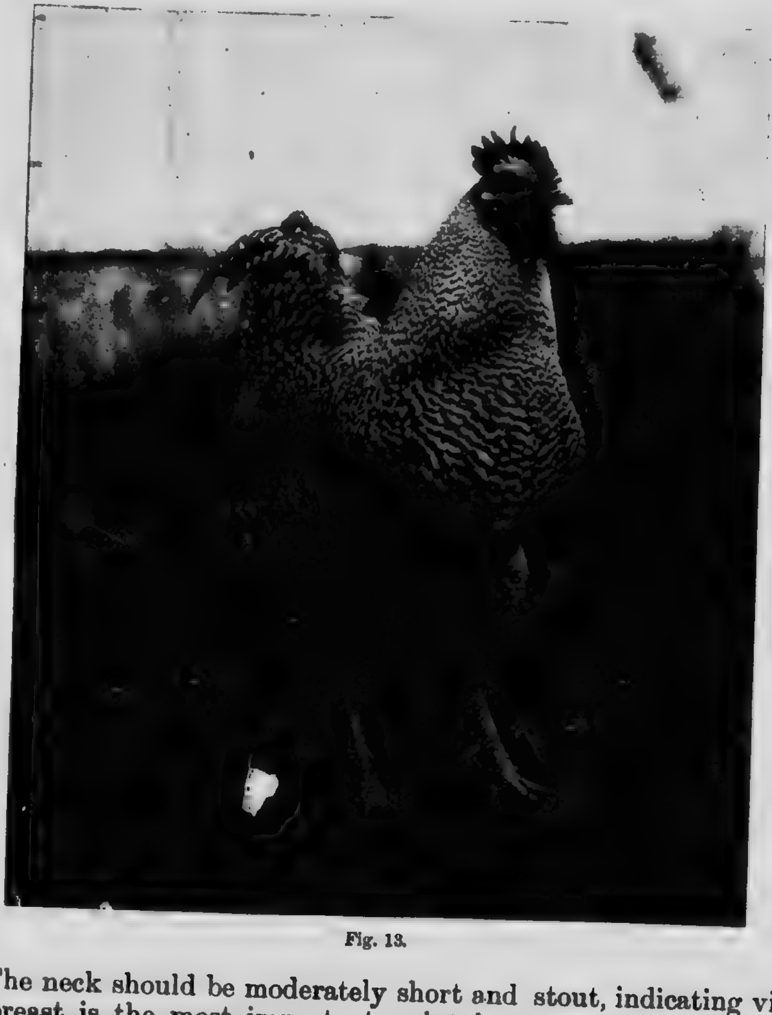


Fig. 13.

The neck should be moderately short and stout, indicating vigor, The breast is the most important point in a market chicken. It should [illegible] broad, *moderately* deep; and, if broad, it will present a fine appearance and appear well-fleshed. It is quite possible that a broad, deep breast will carry more meat than a moderately deep breast of the same width ; yet there is no doubt but that the latter will present much the better appearance, and sell more quickly and at a higher price in the market.

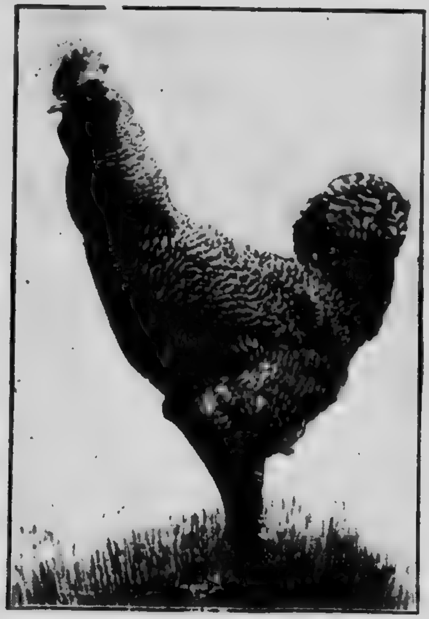


Fig. 14.

When considering the length of breast, we must try to have it come well forward (see Fig. 13), and not be cut off at an angle, as in Fig 14. The body, in general, should present the appearance of an oblong when the head, neck, and tail are removed.

Fig. 15.

Fig. 16.

Fig. 17.

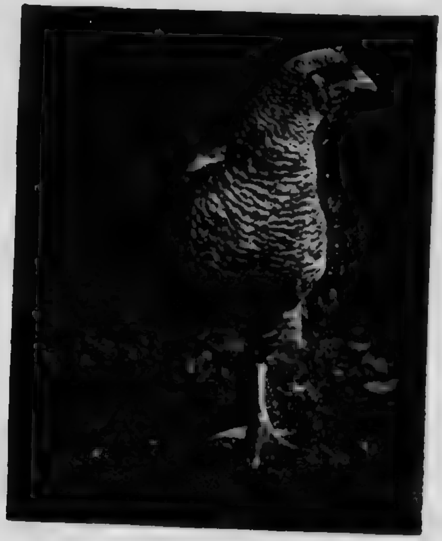


Fig. 18.

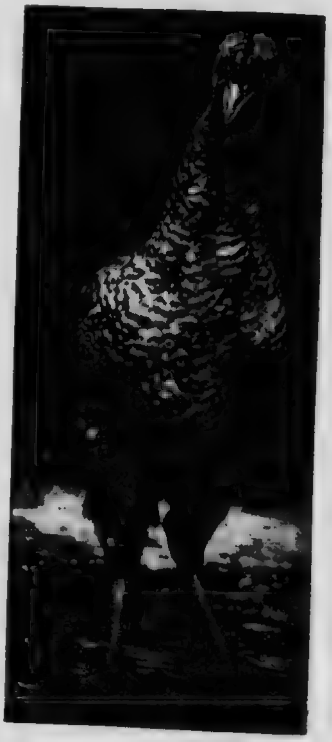


Fig. 20.

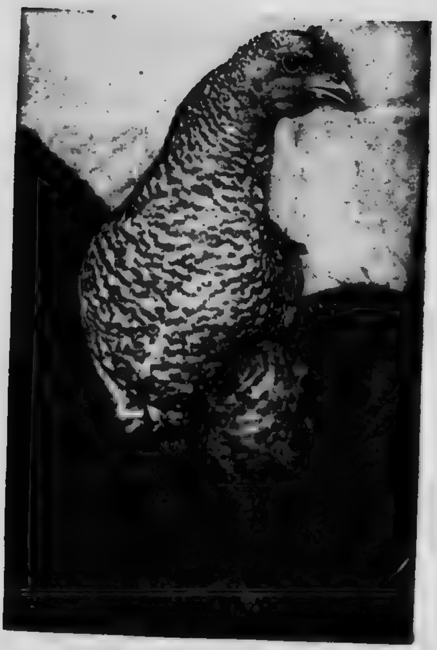


Fig. 19.

We frequently see birds that are very flat in front, and cut up behind, as in Fig. 15. Chickens of this class have a very short breast; and, if the breast happens to be deep, as it is in this bird, the chicken will have a very poor appearance when dressed, as it will show a marked lack of width and length of breast, with excessive depth. (Notice that the head is narrow and long, the body is narrow, the eye is bright but slightly sunken, the legs are long and not straight under the body).

In Fig. 14 observe the very flat breast, the length of back, the long neck and head, the narrow comb, the sunken eye, and the length of legs. The breast comes fairly well back, but not well forward.

In Fig. 13, the bill is short and stout, but not so well curved as it should be. Note the breadth of head, the prominence and brightness of the eye, the short, stout neck, the great width of the breast, the fulness caused largely by the breast bone extending well forward, the short, stout legs (straight under the body), and the width between the legs. There is an expression about this chicken that indicates health and the essence of vigor.

The back should be broad, to give lung and heart capacity; and the width should extend well back to the tail-head. We do not want the wedge-shaped back, as seen in some fowls that have great width at the shoulders and taper rapidly towards the tail-head.

It is much easier to get good-shaped market pullets than good cockerels. The market demands a five-pound bird when dressed, and farmers have gone into raising big chickens. To that end they are asking for large, overgrown cockerels, of excessive depth, for breeders; and the result is that we get dressed chickens weighing four to five pounds each, that have immense, high breast-bones and very long legs. These are not attractive to the buyers, and they sell at less price per pound than plumper birds. For example, if given two birds of the same width of breast, one is one and one-half inches deeper in the breast than the other. The result will be that one bird will look plump and sell readily, while the other will lack in plumpness and be slow in selling. This lack of plumpness can be bred out by using such males as that shown in Fig. 13.

We like to have birds as well built as we can get them; and Fig. 13 is as near the ideal market chicken as we have in the breed which he represents.

The hen, as seen in Fig. 16, is of a good market type. (Note the width and fulness of breast). As a breeder, she is a little fine in bone, and rather too small. She has, however, that blocky appearance which is desirable.

Fig. 17 is a photo of a cross-bred chick (sire, Buff Orpington; dam, Houdan). Note the length and fulness of the breast; also good beak and eye.

Fig. 18 is a ten week's old son of Fig. 13. You will observe the same general characteristics as seen in the father—fair beak, good eye, excellent breast, both as to length and width, without excessive depth. The thigh is also medium in length.

Fig. 19 shows a good head throughout, very full and wide breast, and legs that stand well under the body and well apart. This bird is of the type we like to feed in the fattening crate.

Fig. 20 represents the long, narrow sort. (Note the long beak, the narrow head, the sunken eye, the long neck, and long crooked legs). When dressed, his appearance will not be pleasing.

TRAP-NEST.

Fig. 21 represents a trap-nest made by the college carpenter. This nest is very simple in construction. The door is adjusted low enough so that the hen on entering raises it slightly, thus relieving the hook, which drops back and allows the door to fall. This nest works well. The only objection to it is that the fowls using it require to be pretty much of the same size. A small hen may not raise the door enough to unfasten it.

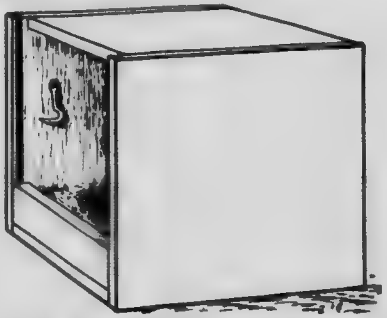


Fig. 21 (*a*). Showing hook which holds up the door. The nest is 12 inches wide, 12 inches high and 15 inches long.

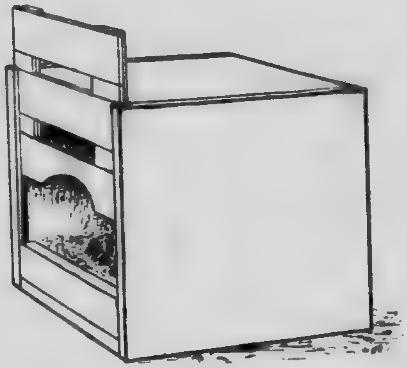


Fig. 21 (*b*). Nest set ready for the hen to enter.

Where one is anxious to build up a special strain of birds, either for special utility or for fancy exhibition purposes, the trap-nest, if looked after, will show what hens lay, and which hen lays certain eggs, thus enabling the breeder to know exactly what he is doing.

They require considerable time in the way of keeping records and releasing hens after laying.

FATTENING CHICKENS.

A number of experiments have been conducted in fattening chickens for the market. There is an unlimited market for well-fleshed fowls in England, and the demand at home is constantly increasing. Fatted chickens were on September 18th, 1903, selling for 13 cents per pound in Montreal, and the dealers could not get nearly as many as they wanted.

The English market requires a white-fleshed chicken, and our best home market also appears to favor this color of flesh. Black-feathered chickens, and those having black legs are not in favor.

There is little use in trying to fatten scrub stock. Good pure-bred males of such breeds as Plymouth Rocks, Wyandottes, and Orpingtons can be purchased at moderate prices, and these only should be used to breed from. Very large chickens are not in favor. What is required is a meaty bird weighing from four to five pounds. The breast should be especially well developed, and should be plump, as this is the most valuable part of the body.

CONSTRUCTION OF FATTENING CRATES.

Fattening crates are usually made 6 ft. 6 in. long, 18 to 20 in. high, and 16 in. wide. The crate is divided into three compartments, each holding from four to five birds, according to the size of the chicken. The crate is made of slats, except the ends and partitions between the compartments, which are solid wood—those on the top bottom and back running lengthwise of the coop, while those on the front run up and down. The slats are usually 1½ inches wide and

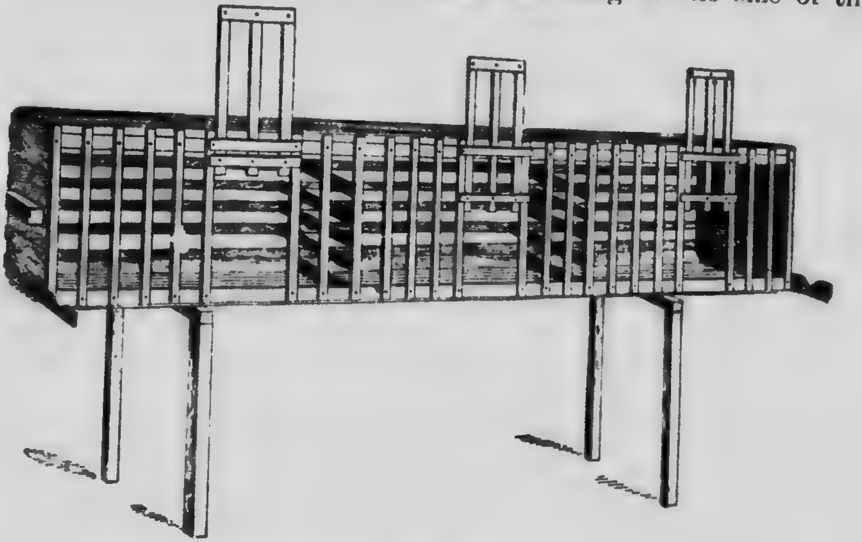


Fig. 22. Showing a single crate or coop.

⅝ inches thick. Those in front are placed 2 in. apart to allow the chickens to put their heads through for feeding. The slats on the bottom are placed about ¾ inch apart, so as to admit of the droppings passing through to the ground. Care should be taken not to have the first bottom slat at the back fit closely against the back. An opening between the first slat and the back prevents the droppings from collecting and decomposing. The slats on the top and back are usually 2 inches apart.

There is a small V-shaped trough arranged in front of the coop for feeding and watering the chickens. This trough is from 2 to 3 inches deep and is generally made of [illegible] lumber.

Very fair coops may be made from old packing boxes, by taking off the front and bottom, and subsituting slats in their places, (see Fig. 22). During warm weather, these crates may be placed out of doors. They need to be protected from the rain which is easily accomplished by placing a few boards over them. In cold weather the crates should be placed in a house or shed where they are protected from raw, cold winds. When fattening chickens inside of a building, it is well to darken the building and keep the birds as quiet as possible.

After each lot of birds is killed, we paint the crates with some liquid lice-killer. Coal-oil and carbolic acid is very good. Use one gallon of coal-oil to one pint of crude acid. We have used some of the prepared mixtures with good results. If the birds (bought from different parties) are very lousy when put up, they should be well dusted with sulphur. The birds should be watered at least twice every day in warm weather. Grit should be given them twice a week.

During the first week, feed lightly,—never quite all the birds will eat. I prefer feeding three times a day during the first week, and twice a day during the succeeding weeks. It seldom pays to feed the birds longer than three or four weeks. Chickens weighing from three to three and one-half pounds each, that are thrifty and of good breeding appear to be the most profitable for feeding. Large chickens, weighing from five to six pounds, gain less and eat more than smaller ones.

Should a bird become sick in the crate, I find that if it is given a teaspoonful of salts and turned out on a grass run it will usually recover.

CRAMMING MACHINE.

The crammer consists of a food reservoir, to the bottom of which is attached a small force-pump moved by a lever and treadle which is worked by the foot of the operator.

Communicating with the pump is a nozzle, through which the food passes to the bird.

"A" is the food reservoir; "B," the pump; "E," the pump rod; "O," the lever, which on being depressed at the lettered end, causes the pump rod "E," to which it is attached, to move downwards, and to eject the contents of the pump "B" out of the nozzle "K." On relieving the pressure at "O," the lever and the parts connected therewith are drawn up by the spring "C," until the motion is arrested by a stop "M," which serves to determine the quantity of food ejected at each depression of the treadle.

The charge may also be varied by arresting the pressure at any point in the downward thrust of the lever "O."

The illustration (Fig. 23) shows one method of operating with this crammer, and this plan is now largely followed in some parts of Sussex, England.

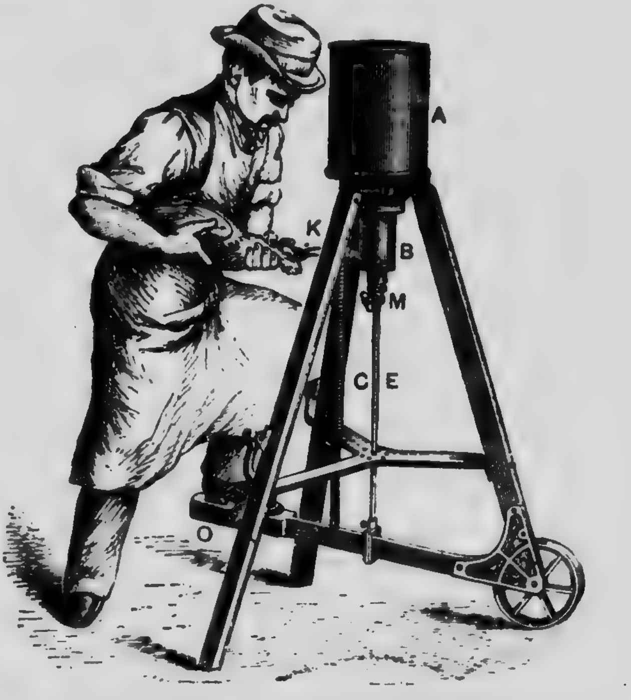


Fig. 23. Cramming machine for the forced feeding of chickens, turkeys, etc.

KIND OF FOOD USED IN CRAMMING MACHINE.

Not all kinds of foods can be used in the machine. The food must be in a semi-liquid condition in order to pass through the machine. This necessitates the use of some kind of grain that will stay in suspension in the milk, beef broth, or whatever liquid is used in mixing the grain. Finely ground oats, with the hulls removed, or shorts, answer the purpose well. We use almost entirely the former food. Grain like corn-chop, or barley meal, are not suitable, as they sink to the bottom of the hopper and clog the machine. When cooked they work well, but are not good foods as is shown by experiments co[illegible]d here—see page 33.

T[illegible] is mixed to the consistency of ordinary gruel, or until it drips from the end of a stick.

WILL IT PAY TO BUY A CRAMMING MACHINE?

For the ordinary person, I think not. First-class chickens may be had by feeding in the crate from the trough only; indeed, I have had equally fleshy birds that have been fed for four weeks from the trough as where we have fed them two weeks from the trough and one week from the machine.

Where one has a special trade for high-class poultry, I am of the opinion that a more uniform product can be secured by using the machine. Machine-fed birds should realize at least one cent more per pound than trough-fed birds in order to pay for the extra labor, etc.

Birds that are fairly well fleshed when put into the crate will do better if put at once on the machine, instead of being crate-fed first.

FATTENING CHICKENS IN JULY.

Early in July, several groups of chickens were put in crates for fattening. The results are given below:

Lot I. consisted of 12 Barred Rock cockerels weighing, when put up in crate, a total of 37 pounds.

	Lbs. Grain Consumed.	Lbs. Skim-milk Consumed.	Lbs. Gain.	Lbs. of grain to make 1 lb. Gain.	Average gain per bird in 4 weeks.
First week	17	25	9	1.8	2.1 lbs.
Second week	24¼	31	5	4.8	
Third week	20	30	8	2.5	
Fourth week	22	33	4	5.5	

Average of grain per lb. of gain in 4 weeks……3.2 lbs.

They were sold to a Montreal firm at 15 cents per pound f.o.b. here.

These chickens were rather leggy, and had high breast bones, and would have dressed much better when they had reached a weight of 6 or 7 pounds.

Lot II. consisted of 8 high-grade Leghorns, weighing a total of 18¾ pounds.

	Lbs. Grain Consumed.	Lbs. Skim-milk Consumed.	Lbs. Gain.	Lbs. of grain to make 1 lb. Gain.	Average gain per bird in 4 weeks.
First week	7	10	4	1.8	
Second week...........	11	16	1½	7.3	
Third week	10	15	3	3.33	1.28 lbs.
Fourth week.............	7	10	1¾	4.	

Average of grain per lb. gain in 4 weeks....3.4 lbs.

When dressed these chickens were somewhat plumper than the Rocks owing to their being mature, but they were rather small. They were sold at 13 cents per pound.

Lot III. consisted of 20 Pit Game Crosses, weighing 40 pounds.

	Lbs. Grain Consumed.	Lbs. Skim-milk Consumed.	Lbs. Gain per week.	Lbs Grain to make 1 lb. gain.	Average gain per bird in 4 weeks.
First week	24	36	9½	2.6	
Second week	27	41	9	3.	
Third week	29	44	14	2.	
Fourth week.....	30	45	3	10.	1.77 lbs.

Average amount of grain per lb. of gain in 4 weeks....3.1 lbs.

These chickens dressed fairly well, the breasts being rather plump; but they had an excessive length of legs and neck. They were sold at 15 cents per pound.

All the lots were fed three times a day on the following rations:

Barley Meal........	2 parts,
Corn Meal, or Chop	2 "
Shorts or Middlings	2 "
Finely Ground Oats	1 "
Animal Meal	1 "

This mixture was used with about one and one-half times its weight of skim-milk.

FEEDING ALL-COOKED FOOD.

We found it impossible to buy finely ground oats during the latter part of August, so we tried cooking rolled oats, barley, and corn-meal. The grains were used in the proportion of 50 per cent. of rolled oats and 25 per cent. each of barley and corn. These foods could not be used in the cramming machine without first being cooked.

Two groups of 12 birds were fed from the trough, one group for two weeks and the other only one week, with the following results:

Group I. consisted of 12 grade Plymouth Rock cockerels. They weighed when placed in the crates a total ot 35¾ pounds. During the two weeks they consumed 103 pounds of cooked food, or equal to about 34 pounds of uncooked grain. They made a gain of five pounds. At the end of the two weeks the birds were very thin and sickly, their digestion being very bad. One of them died. The others were turned out on a grass run, and two of them died the second day they were out. The remainder are beginning to pick up again.

Another lot of 12 Rock chickens, weighing a total of 62 pounds, which had been fed the previous week on raw food, were given cooked food. During the week they were fed on cooked food they lost in weight, and three of them became so sick that they died. The remaining nine were placed on uncooked food the next week, and put on more than three-quarters of a pound each.

Two hundred chickens were crammed with cooked food. A few of the birds gained slightly, but the majority of them lost in weight. After having been fed in this manner for one week, a few of the best were shipped to a Toronto dealer, who complained about there being no meat on the breast. They sold for 9 cents per pound, live weight, while chickens fed on raw food sold for 13 cents per pound. The remaining birds were turned loose on a grass run.

The chief difficulty with the cooked food appears to be that it damages the chicken's digestion. Many of the birds that were put out on the grass run after being fed on cooked food have not recovered yet— three weeks after being turned out.

Cooked food can no doubt be fed to advantage in conjunction with raw food, but an all-cooked ration that is of a forcing nature appears to be entirely unsuitable for fattening fowls.

GRAIN RATIONS.

The following table shows the amount of feed consumed by the different groups of chickens the cost of producing a pound of gain, and the number of pounds of grain it took to make one pound of gain.

Grain Rations.		No. of trials.	Weight when put in crates.	After two weeks feeding.	Gain.	Grain consumed.	No. of pounds of grain to make 1 lb. gain.	Milk consumed.	Cost of pound of gain.
GROUP I—			lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Cornmeal, 5 parts .... Shorts, 4 parts. .... Pearl oat dust, 1 part. Animal meal, 1 part..	Cost per cwt., $1.10	First trial	43	55	12	35	2.916	35	3.5
		Second "	48.5	59.5	11	39	3.54	39	4.263
		Third "	49.5	61	11.5	38	3.3	38	3.974
		Average	47	58.5	11.5	37.33	3.252	37.33	3.912
GROUP II—									
Cornmeal, 2 parts .... Ground buckw't, 2 prts Pearl oat dust, 1 part.	Cost per cw., $1.23	*First trial	.....	...	...	...	.....	.....	.....
		Second "	48.5	65	16.5	42	2.54	42	3.363
		Third "	48	63	15	40.5	2.7	41	3.56
		Average	48.25	64	15.75	41.25	2.62	41.5	3.461
GROUP III—									
Cornmeal, 4 parts ... Ground buckw't, 2 prts Pearl oat dust, 2 parts.	Cost per cwt., $1 22½.	First trial	45	53	8	35	4.375	35	5.797
		Second "	47.5	63	15	41	2.66	41	3.63
		Third "	50	62	12	40	3.3	40	4.416
		Average	47.5	59.3⅓	11.66	38.66	3.445	38.66	4.614
GROUP IV—									
Cornmeal, 2 parts..... Pearl oat dust, 1 part.	Cost per cwt., $1.23	First trial	48	53.5	5.5	34.5	6.27	35	8.34
		Second "	48	60	12	38	3.18	38	4.22
		Third "	48	58.5	10.5	37	3.52	37	4.686
		Average	48	57.33	9.33	36.5	4.32	36.66	5.748
GROUP V—									
Pearl oat dust—cost per cwt., $1.50		First trial	48	60	12	34	2.83	34	4.83
		Second "	49	63	14	40	2.85	40	4.57
		Third "	47.5	60	12.5	40	3.2	40	5.12
		Average	48.166	61	12.83	38	2.96	38	4.84

* This food was not used in the first trial.

The following prices were paid for grain: Corn meal, $1.10 per cwt.; ground buckwheat, $1.20 per cwt.; middlings or shorts, 90c per cwt.; animal meal, $1.60 per cwt. There were 12 birds in each trial of each group. The last ten days of the feeding the birds were fed from the cramming machine, one and one-half pounds of milk being used to one pound of grain.

CONCLUSION.

Ration No. 1 is a good economical producer, but is objectionable, because it has a tendency to produce yellow flesh, which is undesirable in our best market.

Ration No. 2 is, perhaps, the most palatable of any, and it is one that makes a nice white flesh at a moderate cost.

Ration No. 3 is much the same as No 2, except that it contains more corn-meal, which tends to make it less adapted for use during warm weather. Note the results of the first trial. It has a slight tendency towards producing a creamy flesh.

Ration No. 4 is the most unsatisfactory of all. The excess of corn in it decreases its palatability, and also makes it unsuitable for feeding during warm weather.

Ration No. 5 is a good one, when the oats can be purchased at moderate prices. I am of the opinion that rations Nos. 2 and 5 are both excellent, and which it would be advisable to use would depend largely upon the prices of the different grains.

RESULT OF ONE EXPERIMENT WITH CHICKENS OF DIFFERENT WEIGHTS FED BY DIFFERENT METHODS—EXPERIMENT BEGAN OCTOBER 2, 1901.

Groups,—12 birds in each.	Grain fed during the first 2 weeks.	Milk fed.	Cost of feed for first 2 weeks.	Gain in 2 weeks.	Cost of 1 pound of gain.	Feed used during the last 10 days.	Milk used.	Gain during last 10 days.	Cost of food for last 10 days.	Cost of one pound of gain.	Total cost for 24 days' feeding.	Total gain during 24 days.	Cost of one pound of gain (24 days)	Selling price per pound.	How fed.
	lb.	lb.	cts.	lb.	cts.	lb.	lb.	lb.	cts.	cts.	cts.	lb.	cts.	cts.	
No. 10. Average weight 3½ lbs. each (when put up to feed)	41	41	54.12	12	4.51	30	30	3	39.6	13.2	93.72	15	6.248	10	Fed in the fattening crates from the trough only.
No. 4. Average weight 2¾ lbs. each.	34	34	46.2	11.25	4.11	27	27	6	35.64	5.94	81.84	17.25	4.74	10	Fed in the fattening crates from the trough only.
No 20. Average weight 4⅓ lbs. each.	47.5	48	62.75	11.5	5.45	40	40	6	52.80	8.8	115.55	17.5	6.60	10	Fed in the fattening crates from the trough only.
No. 11. Average weight 3½ lbs. each.	40	40	52.80	12.75	4.14	36	48	9	53.40	5.93	106.22	21.75	4.88	11	Fed for the first two weeks in the fattening crates from the trough; the last 10 days from the machine.
No. 3. Average weight 2¾ lbs. each.	35.25	35	46.2	11	4.2	32	48	*5½	48.02	8.72	94.22	16.5	5.71	11	Fed for the first two weeks in the fattening crates from the trough only; the last 10 days by the machine.
No. 21. Average weight 4⅓ lbs. each.	44	48	63.36	11.75	5.39	44	66	11	66	6	129.36	22.75	5.68	11	Fed in the fattening crates the first two weeks from the trough only; last 10 days from the machine.
No. 12. Average weight 3½ lbs. each.	38	38	50.16	8	6.27	24	24	3	31.68	10.55	81.84	11	7.44	9	Fed in a pen, each bird having about 5 square feet of floor space.
No. 2. Average weight 2¾ lbs. each.	34	34	44.88	6.75	6.65	23.5	24	3	31.07	10.36	75.95	9.75	7.78	9	Fed in a pen, each bird having about 5 square feet floor space.
No. 22. Average weight 4⅓ lbs. each.	41	41	54.12	8.5	6.367	28	28	4	34.32	8.58	88.44	13.5	7.07	9	Fed in a pen, each bird having about 5 square feet of floor space.

*One bird in this group died, apparently not being able to stand feeding by the machine.

General Conclusions.

1. It is evident from these experiments that chickens that are being fattened, produce a pound of gain at a less cost when fed in crates than when allowed to run at large in a pen.

2. That the birds fed in the crates from the trough and the cramming machine in addition produced a pound of gain at the least cost, the food consumed being taken into account only.

3. That feeding chickens in a pen loose, is not to be commended when the object is to fatten or flesh them for market purpose.

4. There is a slight difference in favor of a chicken weighing less than four pounds.

DRESSING AND SHIPPING POULTRY.

All fowls should be fasted from twenty-four to thirty-six hours before killing. Where this is not done, the food decomposes in the crop and intestines, the result being that the flesh becomes tainted and does not keep well.

There are two methods of killing that are considered proper. One is to kill by bleeding, which is accomplished by making a deep incision with a sharp knife in the roof of the mouth, immediately below the eyes. This method is considered to be the better one in the Eastern States and also in some parts of Canada. The other method is to kill the bird by wringing or pulling the neck. This is done by taking the chicken in the hands, stretching the neck, holding the crown of the head in the palm of the hand, and giving a quick turn backward, and at the same time a steady pull. This method is favored by the exporters of dressed fowls, and is much cleaner than

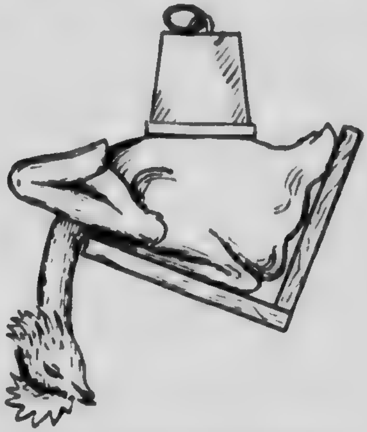


Fig. 24. A chicken weighted in shaping board. (Lewis Wright.)

bleeding the fowls. It is claimed by the exporters that the flesh will keep longer and will not be so dry as where the birds are bled. I prefer the latter method.

After the bird is killed, plucking should begin at once. Care should be taken to keep the head downward, to allow the blood to collect in the neck. Where the birds are allowed to become cool before being plucked, it is very hard to avoid tearing the skin; and the plucking is much more tedious. The birds should be plucked clean with the exception of about two inches of feathers adjoining the head.

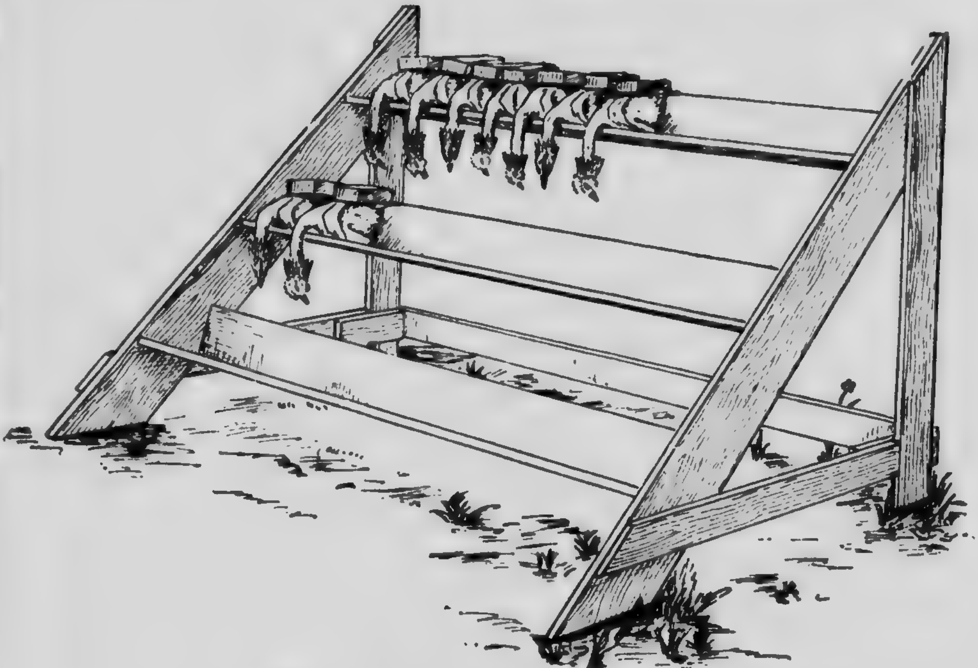


Fig. 25. Showing a number of chickens in the shaping boards.

After the chicken has been plucked, it should be placed on a shaping board, as seen in Figs. 24 and 25. The weight placed on the top of the chicken is used to give it a compact appearance. This weight may be of iron, as seen in the cut, or a brick may be used in its place. If chickens are hung by the legs after being plucked, it spoils their appearance, making them look thin and leggy.

Many good chickens are spoiled by being packed before they are thoroughly cooled. Care should be taken that all the animal heat is out of the body before the fowls are packed. We always cool the birds at least twelve hours before packing them.

The chickens are packed in boxes as seen in Fig. 26. The box is lined with parchment paper; and, if the chickens are to be shipped a long distance, each bird is wrapped in paper. This prevents the chickens from bruising each other, and at the same time, to a considerable extent, checks decomposition. Do not use ordinary wrapping paper, as it draws dampness, and will cause the chickens to become clamy, which makes them more or less unsaleable.

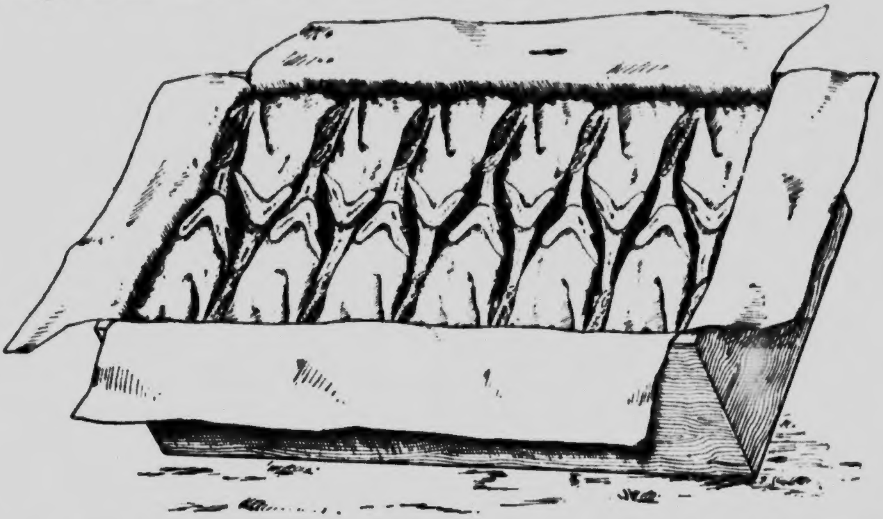


Fig. 26. Showing the top layer of chickens in a shipping case as used for local trade. This is one system of packing dressed poultry. The boxes are usually made 3 feet long, 17 inches wide and 7 inches deep for 24 chickens weighing about 5 pounds each.

There are several other kinds of boxes used for shipping poultry. Nearly every exporter has his own shape of box, and his own method of packing. For shipping locally, we use a box three feet long, twelve inches wide, and twelve inches deep. The chickens are packed similar to those seen in Fig. 26, with the exception that they are three tiers deep. The box will hold thirty-six 4½-pound chickens. The boxes are made strong so that we can have the dealer return them to be refilled. Do not use cedar in the construction of the boxes, as in some cases it taints the flesh. Basswood or spruce answers well.

EGG PRESERVATION.

Several methods of preserving eggs were tested in our Poultry department during the year of 1900. The eggs for this purpose were taken early in June, and were tested in December. Many of the same methods that proved fairly successful in previous years were again tried.

Method No. 1. A solution composed of one part water glass (sodium silicate) and five parts water that had been previously boiled. This was a very strong solution, and unless an egg was absolutely fresh it would not sink in the solution.

The eggs from this solution were of fairly good flavor, and all were well preserved.

Method No. 2. This was similar to No. 1, except that eight parts of water were used instead of five parts. The eggs in this were nearly as good eggs as those in No. 1. This is a good preservative where it is desired to keep summer eggs for winter use.

Method No. 3. This was composed of ten parts of water to one part of water glass. There were no bad eggs in this solution, but the eggs were inferior in flavor and in poaching quality to those kept by methods No. 1 and No. 2.

Method No. 4. This consisted of the same solution as No. 2; but in place of allowing the eggs to remain in the liquid, they were removed after having been in it for a week, except the last lot, which was put into the solution. This lot was left in the solution for the remainder of the season.

(*a*) The eggs, after being in the solution for a week, were removed and placed in an ordinary egg case in the cellar. They were all good when tested, but had evaporated considerably and were lacking in flavor.

(*b*) These were the second lot of eggs to be placed in the liquid. They were handled similarly to those in (*a*), and were of about equal quality.

(*c*) These eggs were allowed to remain in liquid. They were well preserved, all being good.

They were scarcely equal in quality to those from No. 2 method, but were superior to those from No. 3.

Method No. 5. A lime solution made as f[illegible]

Two pounds of fresh lime were slacked in [illegible] and a pint of salt was added thereto. After mixing, the contents of the pail were put into a tub containing four gallons of water. This was well stirred and left to settle. Then it was stirred thoroughly the second time and left to settle; after which the clear liquid was poured over the eggs, which had previously been placed in a crock or tub. Only the clear liquid was used.

These eggs were well preserved; but those from the bottom of the tub had a decidedly limey taste, and the yolk in them was somewhat hardened.

ONTARIO AGRICULTURAL COLLEGE BULLETINS.

Published by the Ontario Department of Agriculture, Toronto.

Serial No.	Date.		Title.	Author.
101	April	1896	Dairy Bulletin (out of print, see No. 114)........	Dairy School O.A.C.
102	May	1896	Experiments in Cheesemaking..................	H. H. Dean
103	Aug.	1896	Experiments with Winter Wheat................	C. A. Zavitz
104	Dec.	1896	Rations for Dairy Cows (out of print)...........	G. E. Day
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106	June	1897	The San Jose Scale........................	J. H. Panton
107	May	1898	Dairy Bulletin (out of print, see No. 114)..	Dairy School
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